Name: Date:

Polynomial Factoring solution (version 43)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 12x + 42 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-12) \pm \sqrt{(-12)^2 - 4(1)(42)}}{2(1)}$$

$$x = \frac{-(-12) \pm \sqrt{144 - 168}}{2(1)}$$

$$x = \frac{12 \pm \sqrt{-24}}{2}$$

$$x = \frac{12 \pm \sqrt{-4 \cdot 6}}{2}$$

$$x = \frac{12 \pm 2\sqrt{6}\, i}{2}$$

$$x = 6 \pm \sqrt{6}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $6 + 3i$ and $-9 - 8i$ in standard form $(a + bi)$.**

Solution

$$(6 + 3i) \cdot (-9 - 8i)$$

$$-54 - 48i - 27i - 24i^2$$

$$-54 - 48i - 27i + 24$$

$$-54 + 24 - 48i - 27i$$

$$-30 - 75i$$

Polynomial Factoring solution (version 43)

3. **Write function $f(x) = x^3 + 5x^2 - x - 5$ in factored form. I'll give you a hint: one factor is $(x - 1)$.**

Solution

	1	5	-1	-5
1		1	6	5
	1	6	5	0

$$f(x) = (x-1)(x^2+6x+5)$$

$$f(x) = (x-1)(x+5)(x+1)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x+2)\cdot(x-1)^2\cdot(x-6)$$

Sketch a graph of polynomial $y = p(x)$.